IBM CICS Transaction Gateway Business Value Proposition

(or, how to open SOA access to CICS applications – and keep your business logic intact)

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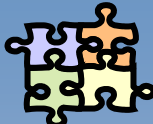*SOA on your terms and our expertise*

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Today's Agenda – CICS TG and your SOA
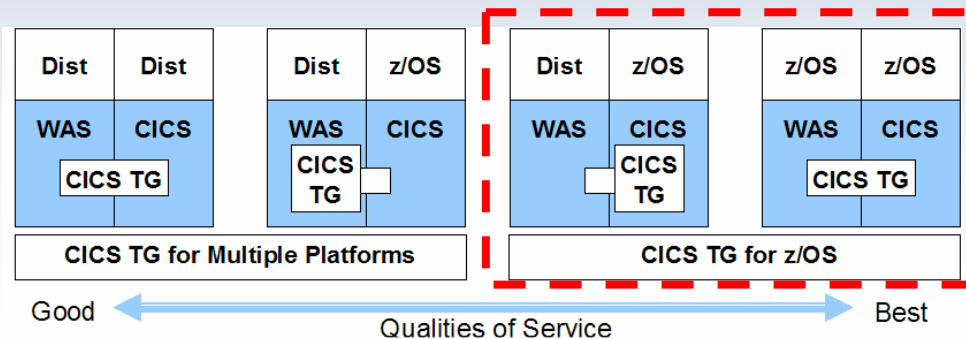*Topics for consideration*

- **What is the CICS Transaction Gateway? What is the Business Value Proposition?**

- **What deployment platform should I choose?**

- **What is Service Orientation and SOA? How does the CICS TG fit into a SOA?**

- **Why should I buy, or upgrade to CICS TG V7?**

- **Where does all this fit in to the 'Big Picture'?**

- **Any questions? Need more?**

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Introducing the CICS Transaction Gateway
Rapidly deploy existing CICS applications in a SOA

Primary connector to CICS	*Java and non-Java API's*	*WebSphere, CICS and others*

Interconnectivity

- High performing and scalable inbound connector to CICS applications

- Provides connectors to COMMAREA and 3270-based CICS applications

Interfaces

- Standard JCA interface is strategic and provides best Qualified of Service

- Base Java, C, C++, COBOL and COM interfaces are supported but stabilized

Integration

- Every in support CICS server on every platform

- WebSphere Application Server, WebSphere ESB, WebSphere Process Server (+ WebLogic)

Dist	Dist		Dist	z/OS		Dist	z/OS		z/OS	z/OS
WAS	CICS		WAS	CICS		WAS	CICS		WAS	CICS
CICS TG			CICS TG			CICS TG			CICS TG	

CICS TG for Multiple Platforms

CICS TG for z/OS

Good ← Qualities of Service → Best

8 x Supported Platforms

- **IBM's flagship z/OS**

- Linux on Intel, POWER, & zSeries

- AIX, HP-UX and Solaris

- Windows

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Key characteristics of IBM CICS Transaction Gateway
The Business Value Proposition

- Popular with the business community because:

  - **<u>High performing</u>**
    - Can support thousands of Transactions Per Second (TPS) with optimised data handling
  - **<u>Secure</u>**
    - Industry standard Secure Socket Layer (SSL) implementation and good integration with CICS and z/OS
  - **<u>Scalable</u>**
    - Multi-Threaded technology and load balancing capabilities maximise scalability and availability

- Popular with the technical community because:

  - **<u>Ease of System Administration</u>**
    - Minimal changes to CICS and usually no changes to CICS applications
    - Simple, familiar mechanisms to configure and manage your gateway
  - **<u>Ease of Application Development</u>**
    - Implements the industry standard J2EE Connector Architecture (JCA) interface
    - Transactional scope, connection pooling and security context all managed outside of the application for easier development
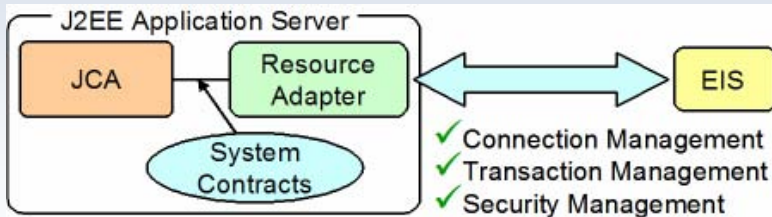
In summary, IBM CICS Transaction Gateway delivers:

- High-performing, security-rich and scalable J2EE standards-based access to CICS applications

- Requiring minimal changes to CICS systems and usually no changes to existing CICS programs

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The J2EE Connector Architecture (JCA)
J2EE standards based access to Enterprise Information Systems

- A component of the Java™ 2 Platform Enterprise Edition specification, alongside other standard services, such as JMS, JDBC and JNDI

- Standard programming interface to all Enterprise Information Systems (EIS), such as CICS, IMS and SAP

- Widely supported in education materials and software tooling from IBM and non IBM vendors

- Delegated management of Connections, Transactions and Security for better, faster application development

In summary, the J2EE Connector Architecture (JCA):

- Enables better applications to be developed faster and deployed into an enterprise wide SOA

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Three CICS Transaction Gateway Deployment Scenarios

Identifying the appropriate architecture
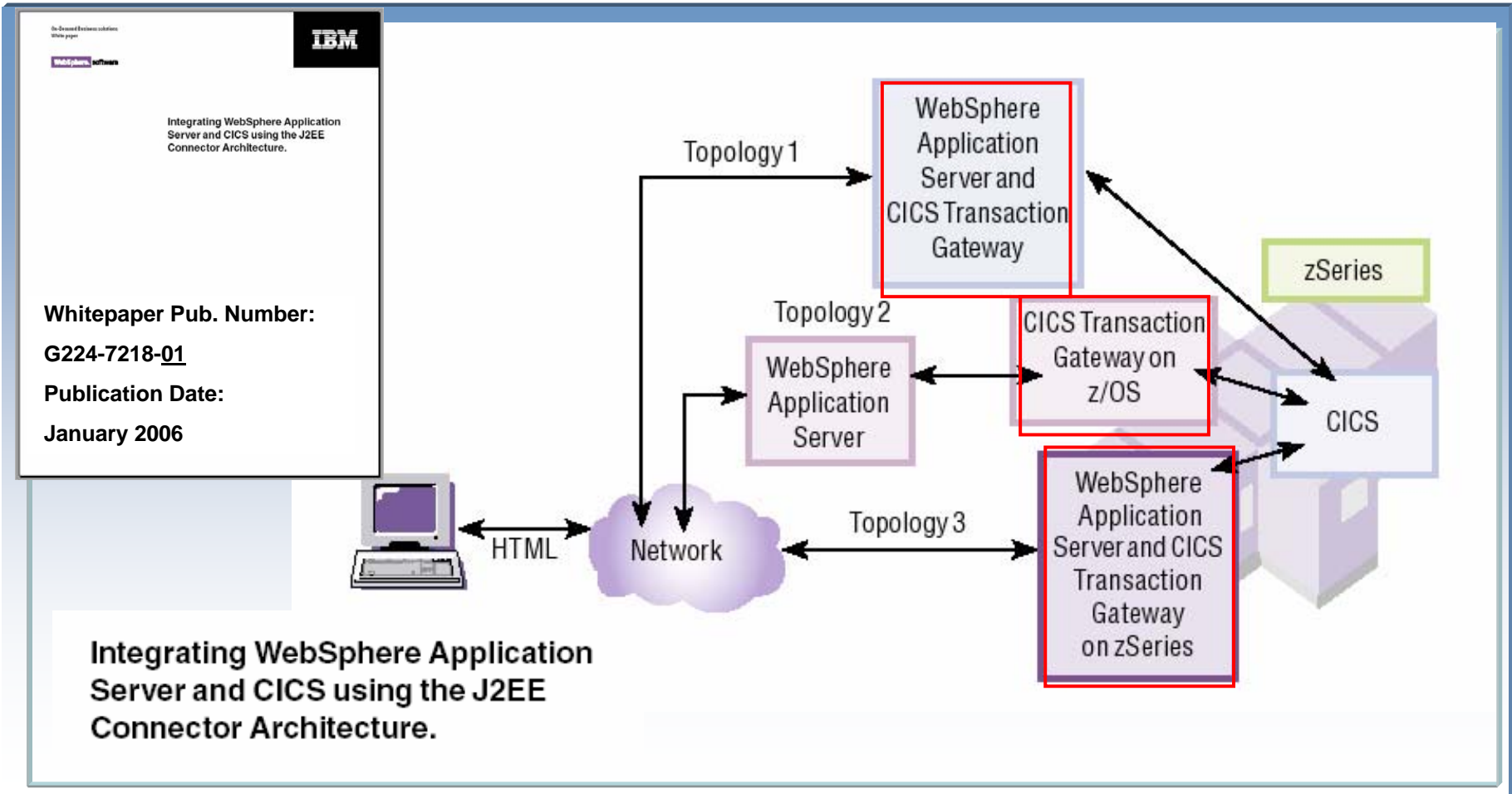
Whitepaper Pub. Number:

G224-7218-01

Publication Date:

January 2006

CICS TG for z/OS or CICS TG for Multiplatforms?

A choice of architectures to meet your unique business requirements

- **CICS TG for z/OS**
  - <u>**Functionality**</u>
    - **JCA** and **Java** interfaces
    - **COMMAREA** applications
    - **TCP/IP** networking
  - <u>**Unique Qualities of Service**</u>
    - Maximum **performance**, highest **availability** and massive **scalability**
    - z/OS specific optimisations including **WLM**, **Parallel Sysplex**, **zAAP**, etc
    - Tightly integrated with **z/OS security** including **RACF** and **Cryptos**
    - Full **two phase commit** with **distributed WebSphere**

- **CICS TG for Multiplatforms**
  - <u>**Functionality**</u>
    - **JCA, Java, C/C++, COBOL, COM**
    - **COMMAREA** and **3270** applications
    - **TCP/IP** and **SNA** networking
  - <u>**Unique Qualities of Service**</u>
    - Most **flexible configurations**, including all supported CICS servers (i.e. **TXSeries**, **VSE**)
    - Access from **non-Java clients** and to **3270** and **COMMAREA** applications
    - **Lower TCA / TCO** for **smaller deployments**

In summary,

- CICS Transaction Gateway provides a flexible choice of architectures to meet your requirements

- CICS Transaction Gateway on z/OS provides the highest QoS for the most demanding deployments

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CICS applications in your Service Oriented Architecture

Linking repeatable CICS business tasks as services

… a service?

A **repeatable business task** – e.g., check customer credit; open new account

… service orientation?
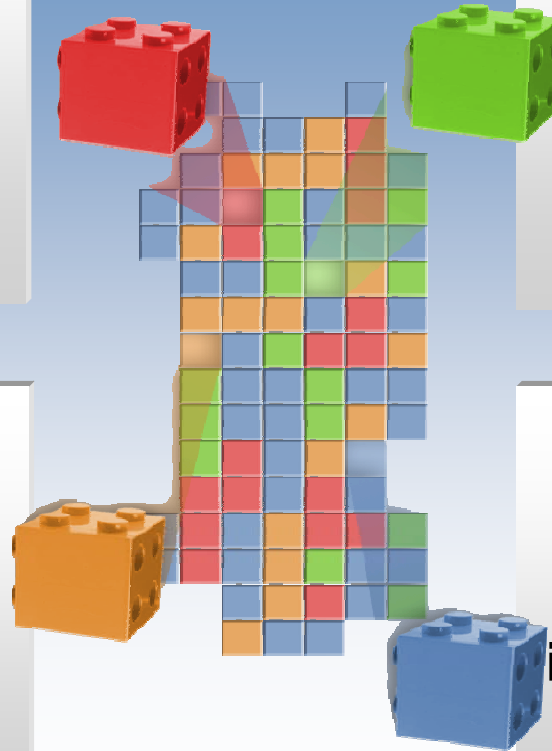
A way of integrating your **business as linked services** and the outcomes that they bring

… service oriented architecture (SOA)?

An IT **architectural style** that supports service orientation

… a composite application?

A set of **related & integrated** services that support a business process built on an SOA

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SOA is not just for new development
Bank of Montreal assembles mainframe-based assets

BMO Financial Group

What is the business challenge?
Revitalize customer relationship management across multiple banking channels

Benefits

- Unified view of customer for personal banking line of business

- Existing investments preserved and re-used

Action taken

- Re-used and assembled CICS assets with new Web services interfaces into new CRM business process

- Used CICS Transaction Server, CICS Transaction Gateway and IBM Application Development tooling

- Web service interfaces deployed on WebSphere Application Server on zSeries to access CICS assets

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The Value of the IBM SOA Foundation
Provides What You Need to Get Started with SOA

IBM SOA Foundation: Integrated, open set of software, best practice, and patterns

Supports complete lifecycle with a *modular* approach

Extends value of your existing investments, regardless of vendor

IBM SOA Foundation

Software

Assemble

Deploy

Model

Manage

Governance & Best Practices

Scalable; start small and grow as fast as the business requires

Extensive business and IT standards support; facilitating greater *interoperability & portability*

Skills & Support
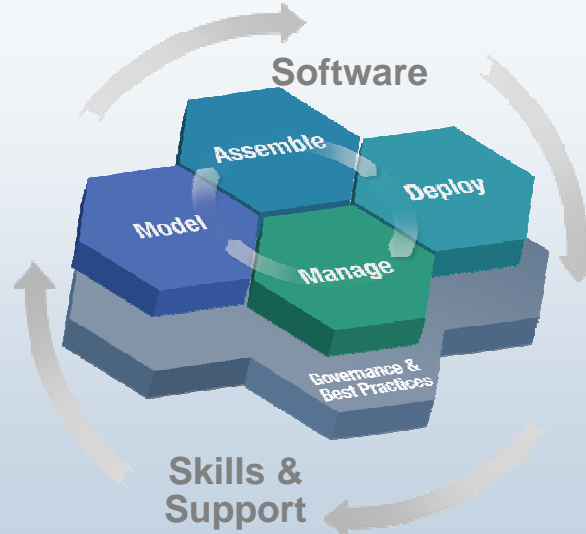
Leveraging existing IT Infrastructure

ORACLE **SAP** **bea** **CICS** **IBM** **WebSphere** **IMS** **Microsoft** **ca** **Custom Apps.**

SOA Reference Architecture
Enabling end to end mixed language solutions

JCA adapters service-enable your applications by connecting them to the Enterprise Service Bus, which powers your Service Oriented Architecture.

- The CICS TG provides a JCA interface from the following WebSphere SOA server products to CICS TS and TXSeries:
  - **WebSphere Application Server**
  - **WebSphere ESB**
  - **WebSphere Process Server**

- IBM provides a number of JCA adapters to connect to multiple Enterprise Information Systems
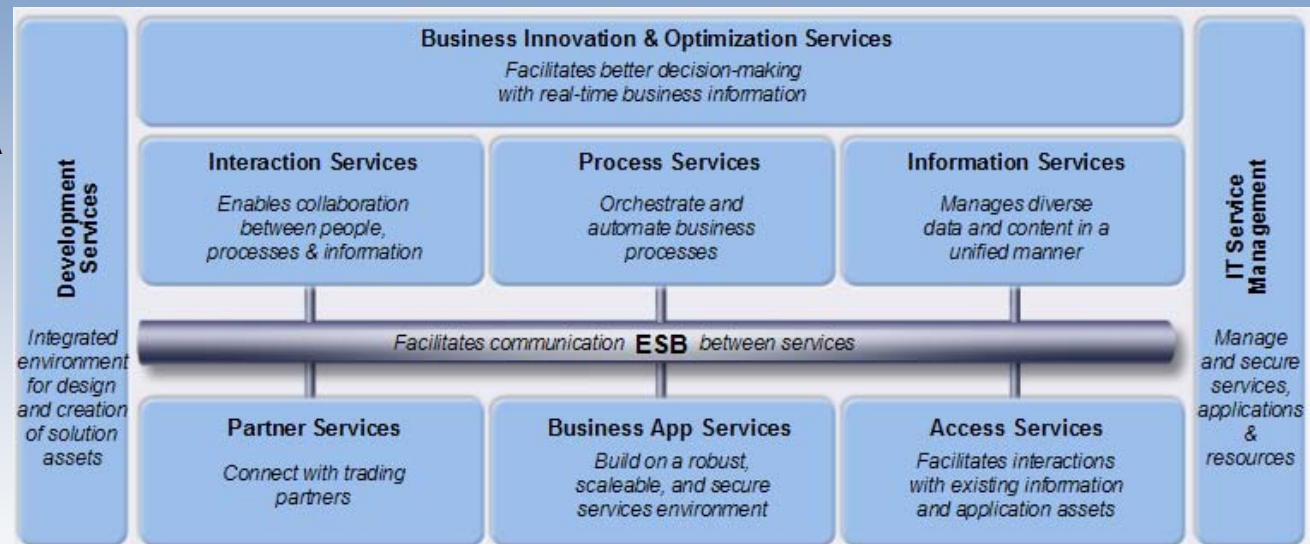
- IBM CICS Transaction Gateway
- IBM IMS Connect / Connect Extensions
- IBM WebSphere Adapters

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Direct Connection or Web Service into CICS?

Comparing and contrasting two complementary SOA technologies

- The difference between a 'direct connection' and a 'Web service' depends on whether or not the presentation applications are directly bound to the business logic.
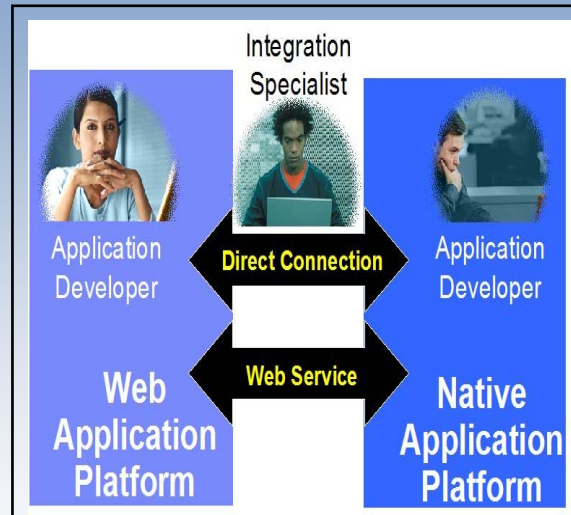
- 'Tightly coupled' direct connections and 'loosely coupled' Web services coexist to fully exploit the agility of an on demand environment

Direct Connection

- High QoS Today

- Mature technologies

- Existing application interfaces

- Few application/system level changes required

- Good where application has fewer reusable purposes

Integration Specialist

Application Developer

Direct Connection

Web Service

Application Developer

Web Application Platform

Native Application Platform

Web Services

- QoS improving via standards

- Emerging technologies

- Web Services interface

- Some application/system level changes required

- Good where application has many reusable purposes

In summary, IBM provides different CICS integration technologies so you can:

- Exploit an appropriate set of complementary technologies needed for different business problems

- Integrate all your CICS assets in an enterprise class Service Oriented Architecture

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Ultimate in high performing, secure and scalable connectivity
CICS TG at one of the worlds largest and fastest growing banks

WebSphere

ECI Call specifies CICS Server Name, Program Name and CTG URL

Sysplex Distributor

Sysplex distributor sprays in bound CTG URLs across LPARS

Gateway daemon for each brand that supports failover to other router region in event of failure.

LPAR1

| CTG1 | CTG2 | CTG3 |

LPAR2

| CTG1 | CTG2 | CTG3 |

Router redirects traffic via standard CICS mechanisms

Brand A Router1 · **Brand B** Router1 · **Brand C** Router1

Brand A Router2 · **Brand B** Router2 · **Brand C** Router2

LPAR3

Brand A Region1 · **Brand B** Region1 · **Brand C** Region1

LPAR3

Brand A Region2 · **Brand B** Region2 · **Brand C** Region2

LPAR3

Brand A Region3 · **Brand B** Region3 · **Brand C** Region3

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Enhancing the core value proposition
CICS TG V6 and CICS TG V7 have continued to enhance core capability

- Increasing the value to the business community:

  - **<u>High performing</u>**
    - Contestant drive for performance optimisations in the base product and across the wire protocol,…
  - **<u>Secure</u>**
    - RACF keyring, SSL and TLS enhancements, Crypto-support,…
  - **<u>Scalable</u>**
    - Pipe limit enhancements, IPv6, WLM, High availability XA,…

- Increasing the value to the technical community:

  - **<u>Ease of System Administration</u>**
    - Monitoring capability, dynamic log management, alignment with native operating systems, standard installations,…
  - **<u>Ease of Application Development</u>**
    - JCA compatibility, two phase commit with distributed WebSphere, integration with Eclipse tooling, increased API's (stst), integrated information centers,…

In summary, IBM CICS Transaction Gateway continues to:

- Drive enhancements in performance, security, scalability, administration and development
- Deliver enhancements across all platforms, with a primary focus on the flagship z/OS environment

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CICS Transaction Gateway Version 6.0
Delivered major enhancements in four key value areas

Qualities of Service
- Performance enhancements and product optimizations via exploitation of the latest J2EE and Linux standards
- Considerable availability and scalability enhancement on our flagship z/OS platform

Systems Management
- Improved administration of the connector through a more functional interface, better aligned with the native operating environment
- Problem determination and management has been enhanced through better recording and control of system information

Security
- Enhanced support for the Industry leading SSL protocol enables fine tuned control of your network security
- Exploitation of the advanced z/OS security features provides a faster and more comprehensive security solution

Ease of Use
- New, industry standard installations vastly simplify the process of installing, migrating and applying maintenance
- Redesigned and searchable Eclipse-based information center provides a greatly improved interface for online documentation

| IBM CICS Transaction Gateway for Multiplatforms V6.0 | Software Announcement 204-284 | Nov. 30, 2004 |
| IBM CICS Transaction Gateway for z/OS V6.0 | Software Announcement 204-283 | Nov. 30, 2004 |
| IBM CICS Transaction Gateway for Multiplatforms V6.01 | Software Announcement 205-147 | Jun. 14, 2005 |

CICS Transaction Gateway for z/OS Version 6.1

Delivered major enhancements in two key value areas

Maximum Transactional Integrity

- Provides global transactional integrity through support for the XA transaction standard
- Adds two-phase commit transactional integration between distributed WebSphere applications and CICS applications running on z/OS

Cross-memory communication

WebSphere applications on distributed platforms

WebSphere applications on z/OS

CICS TG z/OS

CICS applications on z/OS
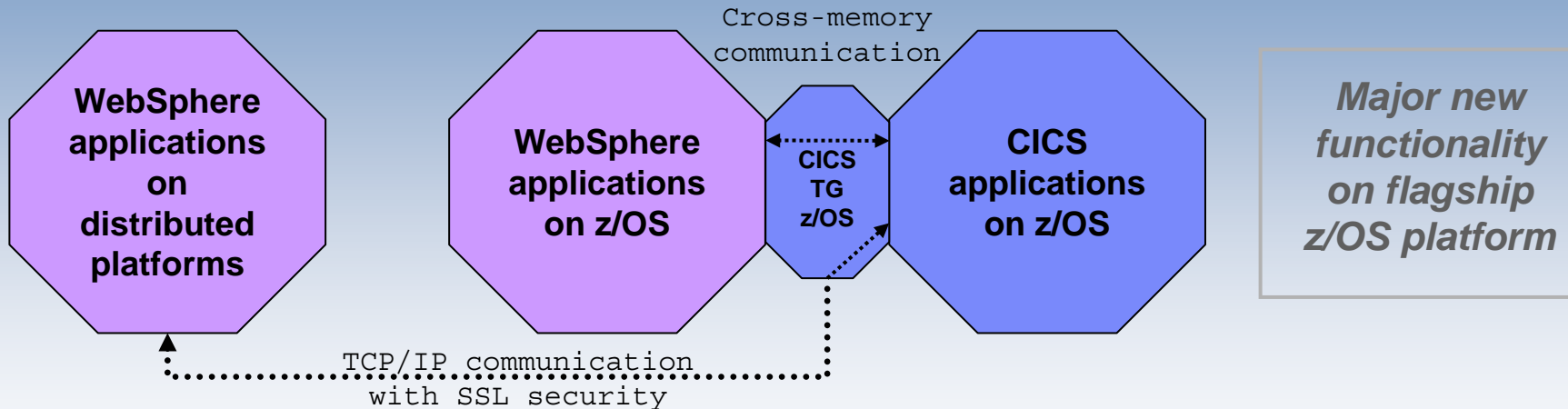
Major new functionality on flagship z/OS platform

TCP/IP communication with SSL security

Enhanced Communications

- Delivers four major enhancements to the reliability, availability and serviceability (RAS) of TCP/IP network communications

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Two-phase commit in the CICS Transaction Gateway
Maintaining data integrity across multiple resource managers

CICS Transaction Gateway for z/OS V6.1 implements the XA Specification, two-phase commit (2PC) protocol.

2PC requires a PREPARE command to be confirmed by each resource manager, before a COMMIT command makes all transaction changes permanent.

Two-phase commit, XA transactional coordination is implemented as part of the JCA 1.5 specification.
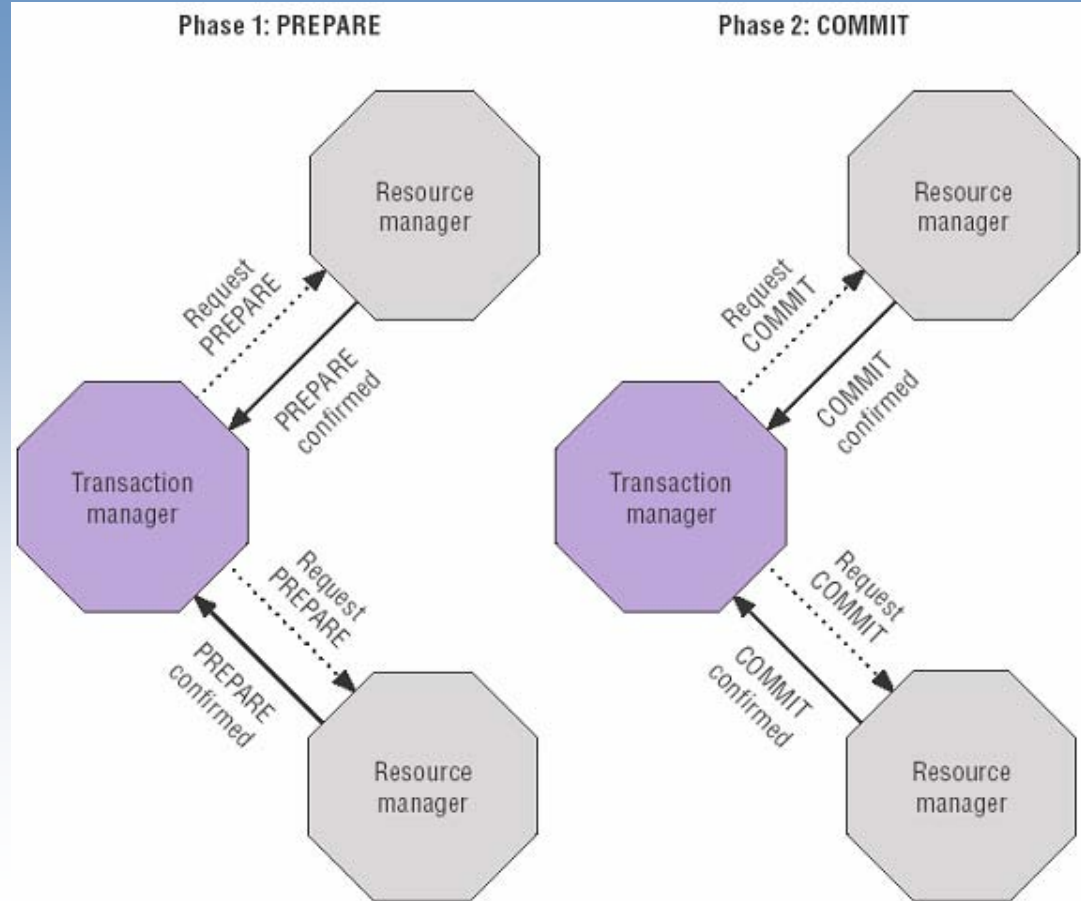
CICS Transaction Gateway Version 7.0
Will deliver major enhancements in three key value areas

Systems Monitoring

- Real time monitoring of CICS TG systems provides the ability to analyse system utilisation metrics and perform online problem determination.
- Access to key statistics about Gateway daemon, CICS Status, Connections, Threads and Protocol handlers via command line or API
- The proximity of workload to the levels set in the configurable limits can be obtained and appropriate action taken, helping to avoid downtime
- Increased availability through support for IBM Tivoli System Automation for z/OS, allowing systems to take predefined courses of action

Extended Networking

- On z/OS, WLM support now enable intelligent distribution of workload across a sysplex, providing increased systems availability
- The ability to process IPv6 connections can provide better routing, enhanced security, and global scalability

Advanced Security

- Latest TLS (SSL) security enables more stringent encryption capabilities and better interoperation with a variety of secure clients.
- Further integration with RACF and System z hardware allows for higher levels of security and increased throughput of security requests

Systems Monitoring – Available Statistics

A Window into the 'Black Box'

Gateway Status: Transactions processed

CICS Status: connections and pipes

Java Client

Gateway daemon

Protocol Handlers

Connection Managers

Workers

JNI

EXCI

MRO/XCF

CICS

Protocol Handler: TCP/IP port usage

Connection Manager Threads

Worker Threads
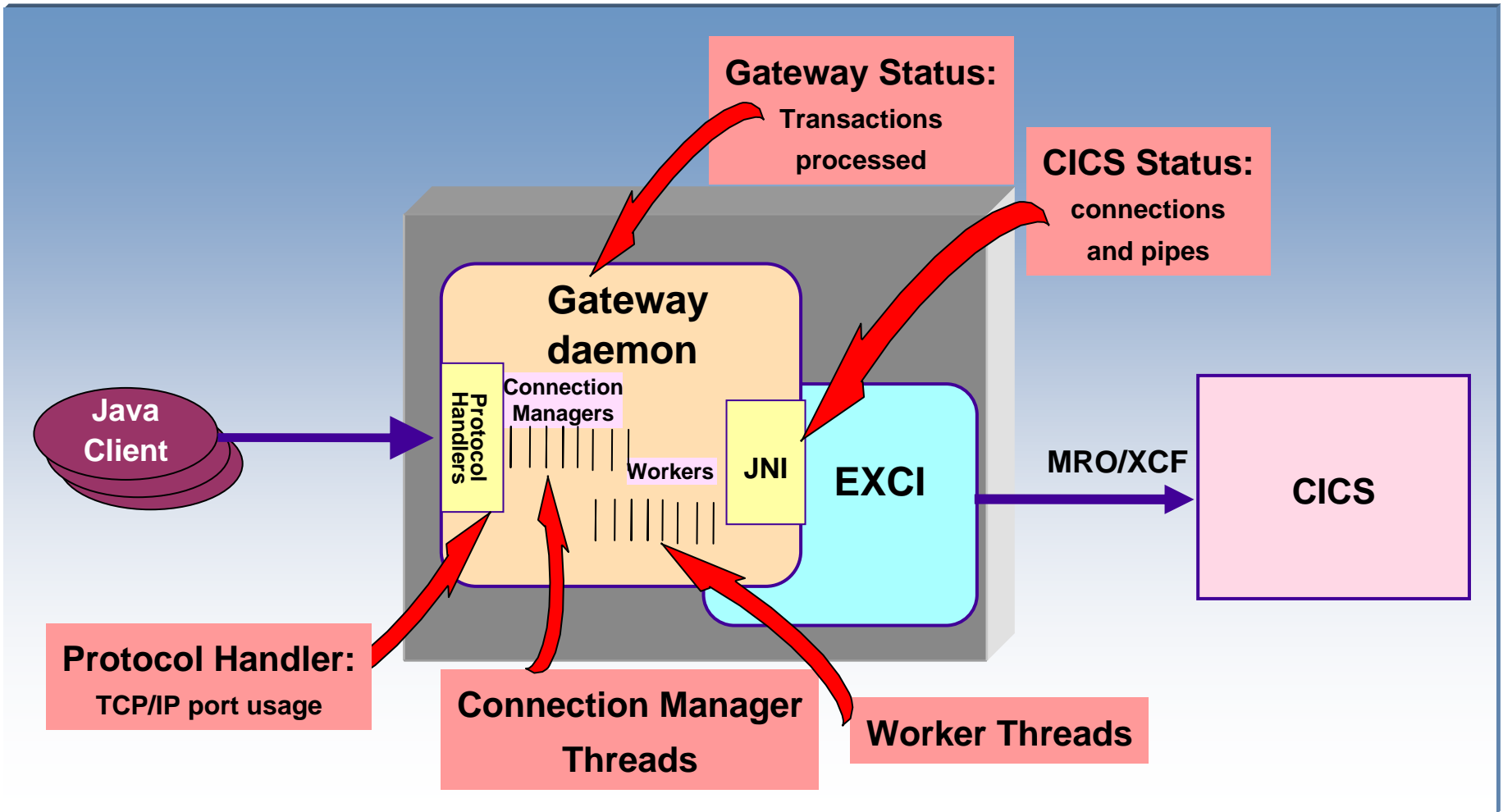
Systems Monitoring – Administration Interface
A Window into the 'Black Box'

```
  Display  Filter  View  Print  Options  Help

 ------------------------------------------------------------------------------------------------------

 SDSF DA MV2C  MV2C       PAG    0  CPU/L    37/ 37       COMMAND ISSUED

 COMMAND INPUT ===> /F CTGPW2,APPL=STATS,GS=CS,WT                      SCROLL ===> CSR

 RESPONSE=MV2C

  BPXM023I (CTGUSER)

  CTG8239I Response received from CICS Transaction Gateway

  GD - Gateway daemon

     GD_CSTATUS=RUNNING (Gateway daemon status)

     GD_SVER=7.0.0.0 (CICS TG version)

     GD_LALLREQ=2300281 (Number of requests processed)

     GD_LLUWTXNC=52 (Extended LUW transactions committed)

     GD_LLUWTXNR=12 (Extended LUW transactions rolled back)

     GD_LSYNCTXN=983 (Successful SYNCONRETURN transaction

     GD_SNAME=CTGPW2 (Gateway daemon name)

     GD_CHEALTH=100 (Gateway health)

     GD_LRUNTIME=282812 (Gateway daemon running time)

  WT - Worker thread

     WT_SMAX=100 (Maximum number of worker threads)

     WT_SINIT=100 (Initial number of worker threads)

     WT_CCURR=100 (Current number of worker threads)

     WT_CALLOC=0 (Currently allocated worker threads)

     WT_LTIMEOUTS=0 (Number of times workertimeout limit hit)


 F1=HELP   F2=SPLIT   F3=END   F4=RETURN   F5=IFIND   F6=BOOK   F7=UP   F8=DOWN   F9=SWAP  F10=LEFT  F11=RIGHT  F12=RETRIEVE
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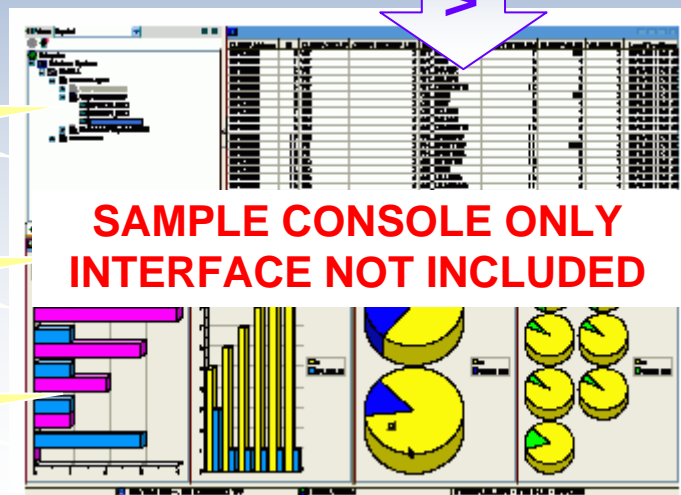
Via Command Line Console

Via API

High water-marks

Configuration values

Current values

SAMPLE CONSOLE ONLY INTERFACE NOT INCLUDED

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The BIG picture
Deliver SOA access to CICS applications - and keep your business logic intact

- How the CICS Transaction Gateway can start your SOA journey:

  - **<u>A Service..</u>**
    - There are millions of CICS applications that could be reused as services
    - Identify which should be service enabled via Web Services and which should use JCA

  - **<u>A Service Orientation</u>**
    - Link these existing IT services with new J2EE services to form a innovative new solutions
    - CICS TG allows SOA access to existing applications - without changing the business logic

  - **<u>A Service Oriented Architecture</u>**
    - Use standards based technologies that are flexible enough to respond to future requirements
    - JCA adapters service-enable your applications by connecting them to WebSphere or your ESB

In summary,

- IBM provides the infrastructure to enable you to service enable your CICS applications

- The CICS Transaction Gateway is a extremely popular method of delivering SOA access to CICS

- Exploit an appropriate set of complementary technologies to integrate all your CICS assets in an enterprise class SOA

Summary – What we talked about

Rapidly deploy existing CICS applications into a SOA
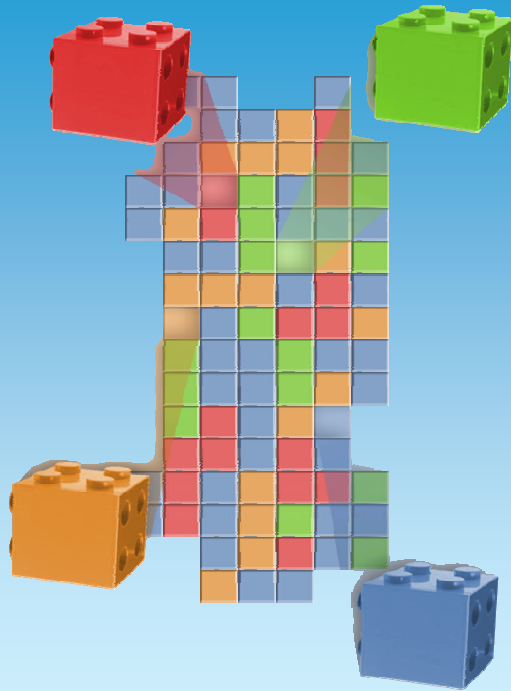
- **Service Oriented Architecture**
  - ▸ What is a Service Oriented Architecture
  - ▸ Modernizing your most valuable assets
  - ▸ IBM SOA Foundation and zSeries

- **IBM CICS Transaction Gateway**
  - ▸ Key Characteristics of CICS Transaction Gateway
  - ▸ The J2EE Connector Architecture (JCA)
  - ▸ Deploy on z/OS or on a Distributed Platform?
  - ▸ Direct Connection or Web Service into CICS?
  - ▸ Enhancements in Version 6.0 and Version 6.1

- **CICS Transaction Gateway V7.0 themes**
  - ▸ Systems Monitoring Ability
  - ▸ Extended Networking Support
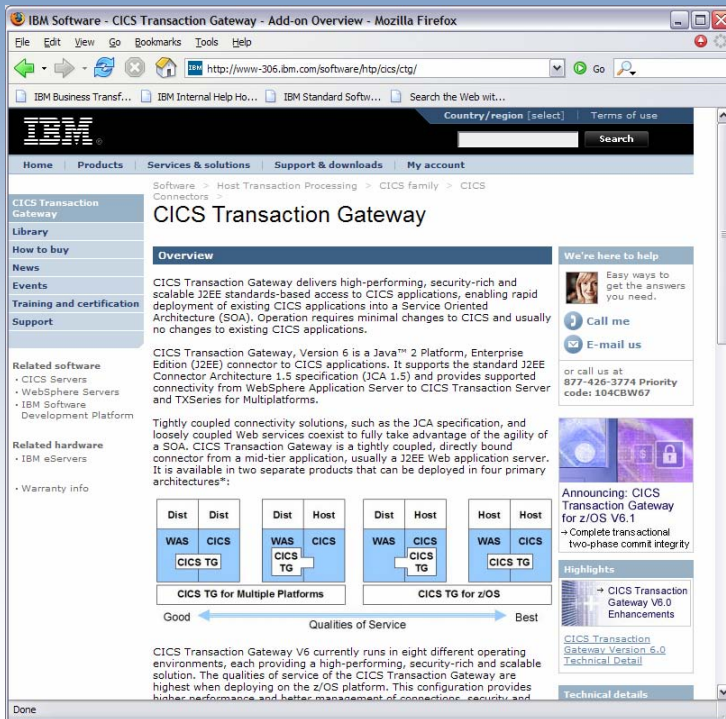 - ▸ Advanced Security Management

Core takeaway:

- SOA is about moving to a more flexible infrastructure - start that journey now!

Questions and More Resources
Rapidly deploy existing CICS applications into a J2EE-based SOA

www.ibm.com/cics/ctg

▪ **Any Questions?**

▪ **Web is the best place for up to date customer information:**

▸ Announcement Letters

▸ Datasheets/Brochures

▸ Redbooks

▸ Whitepapers

▸ Presentations

▸ Technical Library

▸ And more….

Thank you for joining me, please feel free to contact me personally for more information

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